# CI Part II Objectives

- Describe how to conduct contact investigations and identify data that should be collected
- Identify common barriers to contact investigations and management of contacts

# Contact Investigation Steps

1. Initiation
2. Data collection
3. TB transmission risk assessment
4. Contact field investigation
5. Establishing investigational priorities
6. Medical evaluation of close contacts
7. Evaluate need to do further testing based on infection rate
8. 3 month follow-up of close contacts
9. Reevaluate need to do further testing based on infection rate
10. Contact investigation report

# Contact Investigation Steps

- Initiation
  - Start investigation with interview within 1 working day of case report for infectious persons, 3 working days for others
- Data Collection
  - Medical record review
  - Case interview
  - Contacts identified

# Medical Record Review

- Date of birth
- Disease site
- Bacteriology results
- CXR results
- Symptoms/duration
- Social worker's notes
- Demographic data
- HIV status
- PPD results
- Previous history of TB
- TB treatment regimen
- Establish infectious period

# Case Investigation Steps

- Case interview
  - Establish rapport and trust-confidentiality
  - Elicit duration and location of exposure
    - Home
    - Work/school
    - Leisure
  - Obtain locating information
    - Demographic
    - Risk factors
    - Environmental information
    - Frequency and duration of episodes sharing air space
  - Provide TB education

# TB Transmission Risk Factors

- TB transmission risk assessment
  - Person factors (case and contacts)
  - Time factors
  - Place factors

# Infectiousness Factors

Person
Index case and contact

Time
Duration and frequency

Place
Air circulation, proximity, etc

# Person

- Laboratory results
  - Positive AFB smear
    - Rare-possibly infectious
    - Few-probably infectious
    - Numerous-probably very infectious
  - Remember a +AFB smear is not conclusive for *M. tuberculosis;* it simply means that there are mycobacterium in the specimen.
- Clinical indicators
  - Coughing, sneezing, producing sputum
  - Length of symptoms
  - Length of time on anti-TB medication
  - Chest x-ray

# Person Likelihood of Disease Transmission

| Clinical Data | Higher | Lower |
|---|---|---|
| **TB disease location** | Laryngeal/ pulmonary | Extra-pulmonary |
| **Smear status** | Positive | Negative |
| **Smear source** | Spontaneous | Induced or clinical |
| **Chest x-ray** | Cavitary disease | Non cavitary |
| **Symptoms** | Cough | No cough |
| | | |

# Place
# Environmental Indicators

- Circulation of air
- Length of time in the environment
- Size of the facility
- Location of the index case within the facility

# Place
# Likelihood of Disease Transmission

| Factor | Higher | Lower |
|---|---|---|
| **Volume of air common to case/contacts** | Small | Large |
| **Adequacy of ventilation** | Poor | Good |
| **Re-circulated air** | Yes | No |
| **Upper room UV light** | Not present | Present |

# Time

- Duration of exposure indicators
  - Length of time an exposed individual was in contact with the contagious index case

# Contact Factors

- Certain contacts have higher risk of TB disease if infected:
  - Immunocompromised due to medications (corticosteroids, TNF-α inhibitors, etc.) or medical conditions (HIV infected, diabetes mellitus, certain cancers, malnourished, end-stage renal disease, etc.)
  - Young children
- Re-infection possible

  (especially immunocompromised)
- Contact field investigation
  - Home visit essential!

# Contact Investigation Steps

- Purpose of field visit
  - Further interview TB case
  - Interview and skin test contacts
  - Observe contacts for TB symptoms
  - Identify health care sources/make referrals
  - Identify additional contacts

# Contact Investigation Steps (continued)

- Educate contacts about TB and purpose of CI
- Observe environment for potential transmission factors
- Assess contacts' psychosocial needs and other risk factors
- Field Investigation - HOME VISIT ESSENTIAL!

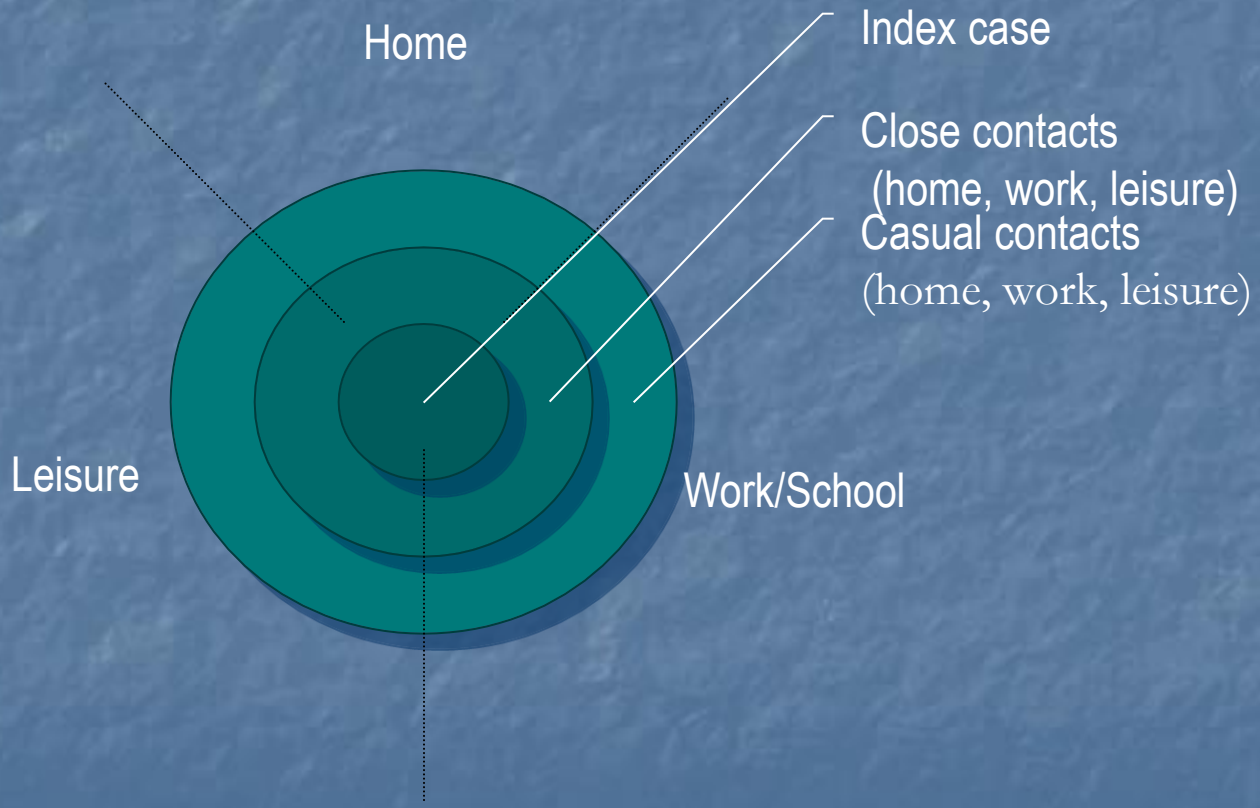
# Contact Tracing

- Skills necessary
  - Assessment
  - Interviewing
  - Counseling
  - Evaluation

# Contact Investigation Steps

- Establishing Investigational Priorities
  - Priorities for index case based on characteristics
  - Priorities for contacts
    - Age
    - Immune status
    - Other medical conditions
    - Exposure
  - Contacts who are HIV infected or are young children receive highest priority

# Historical Perspective
## Concentric Circle Method of Investigation



# Infection Rate

- CDC estimates that 5% of the U.S. population will test positive to Mantoux test.
  - Test higher priority contacts first
  - Extent of recent transmission
- Factors to consider:
  - Population
    - Foreign born

# Contact Investigation Steps

- Medical Evaluation of Close Contacts
  - Mantoux skin testing-read in 48-72 hours
    - Follow-up for:
      - Skin test positives
      - Skin test negatives who are children, adolescents or HIV+
    - Follow-up consists of:
      - Medical evaluation/CXR (sputum specimens as indicated)
      - Treatment for LTBI

# Contact Investigation Steps

- Re-evaluate need to do further testing based on priorities and extent of recent transmission
- Complete follow-up testing 8 to 10 weeks after last exposure
- Contact investigation report
  - Summary of the presenting case
  - Number of negative, newly positive, previously positive, and documented conversions
  - Persons with abnormal CXR, suspects, or new cases
  - Number placed on treatment of LTBI

# Barriers to Investigations and Management of Contacts

- Identifying the contacts
  - Information that is necessary
  - Encouraging the recall of the case
  - Using the contacts themselves as a resource
  - Using open-ended questions
  - Reviewing information with each visit

# Interferon Gamma Release Assay (IGRA) in Contact Investigations

- An IGRA may be used instead of a TST in a contact investigation (retest 8-10 weeks)
- An IGRA is preferable in groups that have historically low rate of returning for TST reading
- An IGRA is preferable in persons who have received BCG
- A TST is preferred in children less than 5 years of age

# TB Genotyping

- Identify TB patients involved in recent transmission
- Confirm epidemiologic links
- Detect outbreaks earlier, control them more rapidly
- Reduce false-positives
- Uncover unsuspected relationships between cases
- Discover new transmission settings
- Improve inter-jurisdictional case finding
- Evaluate TB programs

# TB Genotyping- keys to remember

- Genotyping data will improve contact investigation- never replace!
- Helps understand transmission trends
- Very useful for unstable populations

# Barriers to Investigations and Management of Contacts

- Finding the contacts
  - Available resources to search
  - Time line for searching
- Involving the contacts in the process
  - Using culturally-sensitive material
  - Interpreters
  - Maintaining a non-threatening approach
  - Adapting to their lifestyle and time constraints
  - Identifying their anxieties and fears

# Barriers to Investigations and Management of Contacts

- Skin testing procedure
  - Teaching and sharing information
  - Reviewing, reviewing, reviewing
  - The importance of the scheduled return time
- Providers
  - Finances
  - Medical providers
  - Language issues
  - Work schedules/transportation issues

# Additional Resources


- Centers for Disease Control and Prevention. Interactive Core Curriculum on Tuberculosis: What the Clinician Should Know. Centers for Disease Control and Prevention: Atlanta, GA; 2004. (print publication under revision and due to release Dec 2009)
- Centers for Disease Control and Prevention. Self-Study Modules on Tuberculosis: Contact Investigations for Tuberculosis. Centers for Disease Control and Prevention: Atlanta, GA; 2008.
- Performance Guidelines for Contact Investigation: The TB Interview. New Jersey Medical School National Tuberculosis Center (http://njms2.umdnj.edu/globaltb/audioarchives/basicinterviewing.htm )
- Centers for Disease Control and Prevention. Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis. MMWR *Recommendations and Reports* December 16, 2005 / 54(RR15); 1-37.